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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/055,058	01/22/2002	Varadarajan Srinivasan	P191-CIP	9129

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EXAMINER

CHACE, CHRISTIAN

ART UNIT	PAPER NUMBER
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2187

DATE MAILED: 03/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/055,058	Applicant(s) SRINIVASAN ET AL.	
	Examiner Christian P. Chace	Art Unit 2187	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 November 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-36 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 30-33 is/are allowed.
- 6) ☒ Claim(s) 1-5, 8-11, 17-19, 22, 28, 29 and 34-36 is/are rejected.
- 7) ☒ Claim(s) 6-7, 12-16, 20-21, 23-27 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 January 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

This Office action has been issued in response to amendment filed 26 November 2004. Claims 1-36 are pending. Applicants' arguments have been carefully and respectfully considered, but they are not persuasive. Accordingly, this action has been made FINAL.

Specification

The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-5, 8-11, 17-19, 22, 28-29, and 34-36 are rejected under 35 U.S.C. 102(e) as being anticipated by Srinivasan et al (US Patent #6,237,061).

The applied reference has a common assignee and three common inventors with the instant application. Based upon the earlier effective U.S. filing date of the reference,

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it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

With respect to independent claim 1, a CAM system is disclosed in the title.

A ternary CAM array segmented into a plurality of array groups is disclosed in figure 6 as group #202. Each array group including a plurality of rows of ternary CAM cells (inherent in a ternary CAM that it has ternary CAM cells) is disclosed in figure 6 as one of the four rows in each group.

A plurality of first storage elements each for storing a priority of a corresponding array group is disclosed in figure 6 as the CAM index. As discussed in column 5, lines 34-55, the groups are prioritized by length of prefix by the index.

With respect to claim 2, two or more array groups having the same priority is disclosed in figure 6, as groups #202 and #204 both share the same index, or priority, as discussed supra.

With respect to claim 3, one of the rows of the ternary CAM cell comprising a plurality of CAM cells for storing a data word is inherent, but is shown in figure 6, where there are two four-bit words per row, and four rows per group, as discussed supra. A plurality of mask cells is disclosed in figure 6 as "MASK CELL."

With respect to claims 4 and 5, each data word comprising a "policy statement" is disclosed in the abstract as CIDR addresses being loaded into the CAM cells. CIDR is

Classless Inter-Domain Routing, which is an addressing protocol, or policy. Therefore, CIDR addresses comprise a “policy statement,” and is a protocol.

With respect to claim 8, each local mask word including a policy mask is disclosed in column 4, lines 30-34.

With respect to claim 9, a plurality of second storage elements each for storing a group valid bit indicating whether an associated array group is assigned its corresponding priority number is disclosed in figure 4, #108.

With respect to claim 10, a priority table including the plurality of first storage elements is disclosed in column 5, lines 34-55, which discusses the CAM itself serving as the priority table.

With respect to claim 11, an index circuit coupled to the ternary CAM array to determine the index of a location in the ternary CAM array that stores data that matches a search key is disclosed in figure 6, which shows the “index.” Inherently, if there is an index, there is a circuit to determine the index, as a computer must always be told what to do.

With respect to claim 17, examiner notes that 35 USC 112, sixth paragraph is invoked in the instant claim, as the claim recites means-plus-function language. Accordingly, the means referred to must be the means disclosed in the specification. The instant specification discloses a longest prefix match as a means for string data in the array groups according to priority. Column 5, lines 34-55 disclose CIDR – longest prefix match storage.

With respect to claim 18, an address circuit coupled to the ternary CAM array to select a row of the ternary CAM cells for communicating data is disclosed in figure 4, #112.

With respect to claim 19, the address circuit comprising an address decoder to select a row in one array group corresponding to the priority in response to a next free address is disclosed in column 5, lines 22-24. A “next free address,” is merely writing to the next address to be written to.

With respect to claim 22, each of the rows of ternary CAM cells including a valid bit storage element for storing a valid bit indicative of whether the corresponding row of ternary CAM cells stores valid data (which is what a valid bit is, and does, by definition), is disclosed in figure 4, #108.

With respect to independent claim 28, a method of operating a content addressable memory (CAM) system including an array of ternary CAM cells segmented into a plurality of array groups is disclosed in the title and with respect to claim 1, supra.

Storing a plurality of priorities in a plurality of storage elements each associated with one or more of the array “groups,” wherein each array “group” includes a plurality of “rows” of the CAM “cells” (discussed with respect to claim 1 supra) is disclosed in figure 6 as the “CAM index.” The index being related to the priority is discussed supra with respect to claim 17.

Selectively storing data in the array groups according to priorities is also discussed supra with respect to claim 17.

With respect to claim 19, providing a next free address of an available row of ternary CAM cells within an array group corresponding to one of the priorities, and storing the data at the next free address is disclosed in column 5, lines 22-24. A "next free address," is merely writing to the next address to be written to. Examiner notes that this is merely writing to the CAM, or loading, as is disclosed in the abstract.

With respect to claim 34, selectively comparing a search key, or comparand, with data stored in the array groups is disclosed at the end of column 5 into column 6.

With respect to claim 35, comparing the search key with data stored in the array groups to generate match signals, comparing the associated priorities of each array group that includes data that matches the search key to generate a plurality of enable signals, and selectively qualifying the match signals in response to the enable signals to generate qualified match signals is disclosed in column 6, lines 5-15.

With respect to claim 36, generating an index of the highest priority match in response to the qualified match signals is disclosed in column 6, lines 11-13.

Allowable Subject Matter

Claims 30-33 are allowed.

Claims 6-7, 12-16, 20-21, and 23-27 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

With respect to applicants' argument (offered both with respect to claim 1 as well as claim 28) that Srinivasan fails to disclose or suggest a CAM array that is segmented

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into a plurality of array groups, with each array group including a plurality of rows of CAM cells, examiner respectfully disagrees. Applicants do not define what a row or group is, specifically, in the instant specification. In fact, the instant specification at page 8, in lines 20-25, discloses "k" rows for storing "k" words. "K" may be any number. Applicants further assert that the four sets of binary values to which the examiner refers are not four different entries to be stored in different rows of Srinivasan's array, but are rather binary representations of corresponding CIDR addresses. However, applicants do not point to any section of the specification that would further limit and more specifically define the terms, "array," "entry," "cell," "group," and/or "row," than examiner has interpreted them as. In other words, applicants' arguments are not commensurate with the scope of the actual claim language. However, even if applicants should narrow the scope to meet the instant arguments, examiner would respectfully refer applicants to Hiraki et al, US Patent #5,485,418, in the abstract, which clearly discloses the arrangement applicants are instantly arguing, but not claiming. See also figures 1, 3, and 4 of Hiraki et al.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the

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shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christian P. Chace whose telephone number is 571.272.4190. The examiner can normally be reached on MAXI FLEX.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Donald Sparks can be reached on 571.272.4201. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Christian P. Chace
Examiner
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